5. STORAGE TANKS

If your cooperative conducts vehicle maintenance or refueling activities, chances are you have storage tanks. Common materials stored in tanks at cooperatives include petroleum products (such as gasoline, diesel, and used motor oil) and certain hazardous substances (such as antifreeze). As the owner, you are responsible for the safe operation and maintenance of your tanks. This chapter summarizes the Federal regulations and requirements for operating and maintaining storage tanks, both underground and aboveground, and provides information to assist you in complying with the regulations. Although the Federal storage tank regulations are often adopted by states, state and/or municipal requirements can be more stringent.

DEFINITION

A storage tank is a stationary device designed to contain an accumulation of substances, and constructed of nonearthen materials (i.e., concrete, steel, plastic) that provide structural support.

5.1 UNDERGROUND STORAGE TANKS

As defined in the Federal Regulations, an UST is "any one or combination of tanks (including underground pipes connected thereto) that is used to contain an accumulation of regulated substances, and the volume of which (including the volume of underground pipes connected thereto) is 10 percent or more beneath the surface of the ground." The federal UST regulations apply only to those tanks storing either petroleum products or certain hazardous substances. EPA estimates there are approximately 1 million USTs in the United States that contain such materials.

5.1.1 Why Are USTs Regulated?

Leaking USTs can cause environmental and safety hazards.

The reason for the regulation of USTs is that EPA estimates that many of the approximately 1 million USTs (including their piping) in the United States that contain petroleum products or hazardous substances are leaking. Leaking USTs can cause fires or explosions that threaten human safety. In addition, leaking USTs can contaminate soil or nearby groundwater. Because 50 percent of the U.S. population uses groundwater as a source of drinking water, the UST regulations were developed to minimize these risks and safeguard the nation's groundwater resources.

A release is any spilling, leaking, emitting, discharging, escaping, leaching, or disposing from an UST into groundwater, surface water, or

subsurface soil. Table 5-1 describes common causes of UST leaks and releases to the environment.

Table 5-1. Common Causes of Release from USTs

Cause of Leak	Description of Leak
Piping failures	Most leaks result from piping failure. Piping is smaller and less sturdy than tanks. It is assembled in the field with numerous connections and usually installed near the ground's surface. As a result, piping suffers much more than tanks from the effects of installation mistakes, excessive surface loads, and the stress of underground movement.
Corrosion	Buried bare metal can corrode and deteriorate. Many older USTs have bare metal tanks and piping that are not protected from corrosion.
Spills and overfills	Spills occur when a delivery truck's hose is disconnected incorrectly. Overfills occur when more petroleum is delivered into the tank than it can hold.
Installation errors	Tanks and piping also leak if they are not placed in the ground properly. For example, leaking can result if poorly selected or compacted backfill material is used when covering an UST, or if pipe fittings are inadequately attached to the UST.

EPA developed the UST regulations to make sure the following goals are reached:

- To prevent leaks and spills
- To find and correct problems created by leaks and spills
- To make sure that owners and operators of USTs can pay for correcting the problems created if their USTs leak.

5.1.2 What Are the Federal UST Regulations?

Federal UST regulations are found in Subtitle I of RCRA

In 1984, Congress amended the Resource Conservation and Recovery Act (RCRA) to require EPA to develop regulations to protect public health and the environment from leaking USTs. The amendment included a section, Subtitle I, that established a new and comprehensive regulatory program for UST systems containing petroleum products or substances defined as hazardous under Section 101.14 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980. Federal Regulations for underground storage tank systems (USTs) are contained in 40 CFR Part 280.

Subtitle I of RCRA governs activities and requirements related to UST systems. It includes the following provisions for UST systems:

- Design, construction, installation, operating and notification requirements for new and existing systems.
- Release detection, reporting, investigation, confirmation, release response, and corrective action for systems containing petroleum or hazardous substances.
- System closure requirements.

USEFUL TIP

States generally have the same requirements as RCRA Subtitle I. However, some States (and municipalities) have more stringent UST regulations. You should contact your State UST office and your local municipality to determine if there are additional UST regulations you must comply with.

The regulations describe the steps you, as an UST owner or operator, need to take to help protect our health and environment. These steps will also help you avoid the high cost of cleaning up the environment and involving yourself in legal actions that can result if your tank or its piping leaks.

USEFUL TIP

Please note that you can easily obtain free booklets from EPA that provide clear but detailed descriptions of the UST requirements. A list of these booklets is provided in Section 5.1.3. EPA also makes these materials and much other UST information available at a Web site maintained by EPA's Office of Underground Storage Tanks at **http://www.epa.gov/OUST/**. This chapter summarize material found in EPA publications.

Exemptions to Federal UST regulations

The federal UST regulations do **not** apply to:

- Tanks with a capacity of 110 gallons or less
- Farm and residential tanks holding 1,100 gallons or less of motor fuel used for noncommercial purposes
- Tanks storing heating oil used on the premises where it is stored
- Tanks on or above the floor of underground areas
- Septic tanks and systems for collecting storm water and wastewater
- Flow-through process tanks

- Emergency spill and overfill tanks.

Additional categorical exemptions

USTs providing fuel to emergency generators are among those deferred by Federal regulations from leak detection requirements (see Section 5.1.4). In addition, large, field-constructed tanks (tanks assembled or constructed at the site as opposed to tanks manufactured in a factory) are deferred from both leak detection and upgrade requirements (see Section 5.1.4).

5.1.3 How Do I Comply with the Federal UST Regulations?

Federal regulations require that all regulated UST systems should be designed and constructed to retain their structural integrity throughout their operating life, and all USTs and attached piping should be protected from corrosion. In addition, all systems must be equipped with proper devices to prevent overfills and to control or contain spills. Release detection methods must be implemented to meet the performance criteria specified in the UST regulations.

Regulations contain require-ments for new, existing and all UST systems.

To meet the requirements of RCRA Subtitle I, EPA has requirements that apply to all UST systems, to existing UST systems, and to new UST systems. "Existing" UST systems are those that were installed before December 22, 1988; "new" systems are those installed after that date. The requirements or compliance deadlines can differ for new and existing USTs in respect to leak detection and spill, overfill, and corrosion protection, as discussed in the following pages.

Requirements Applicable to All UST Systems

Your responsibilities

In general, for all USTs at your cooperative, you are responsible for assuring that there are no leaks or spills from your USTs, including assuring that USTs maintain their integrity and are protected from spills, overfills, and corrosion. To meet these goals, your cooperative should regularly review areas around the tanks to observe any signs of tank spills, overflows, and leaks.

Requirements

In addition, your cooperative is required to submit appropriate notification information to EPA or your State or local implementing agency, and maintain all records including permits, registrations, and installation or closure records at your cooperative. Requirements for notification, recordkeeping, leak detection, and spill, overfill, and corrosion protection are described below.

Notification

You must report to the regulatory authority on the following occasions:

- When you install an UST, you have to fill out a **notification form** available from your state. This form provides information about your UST, including a certification of correct installation. (You should have already used this form to identify your existing USTs. If you haven't done that yet, be sure you do so now.)

- You must report suspected releases to the regulatory authority. If a release is confirmed, you must also report follow-up actions you plan or have taken to correct the damage caused by your UST.

- You must notify the regulatory authority 30 days before you permanently close your UST.

You should check with your regulatory authority about the particular reporting requirements in your area, including any additional or more stringent requirements than those noted above.

Recordkeeping

You will have to keep records that can be provided to an inspector during an on-site visit that prove your facility meets certain requirements. These records must be kept long enough to show your facility's recent compliance status in four major areas:

- You will have to keep records of **leak detection** performance and maintenance:

  - ✔ The last year's monitoring results, and the most recent tightness test.

  - ✔ Copies of performance claims provided by leak detection manufacturers.

  - ✔ Records of recent maintenance, repair, and calibration of on-site leak detection equipment.

- You will have to keep records showing the required inspections and tests of your **corrosion protection** system.
- You must keep records showing that a **repaired or upgraded UST system** was properly repaired or upgraded.

- For at least 3 years after **closing an UST**, you must keep records of the site assessment results required for permanent closure. (These results show what impact your UST has had on the surrounding area.)

- You must keep records that document your financial responsibility (as explained in EPA's booklet, **Dollars And Sense**, see 5.3.1).

You should check with your regulatory authority about the particular recordkeeping requirements in your area. Generally, you should follow this useful rule of thumb for recordkeeping: When in doubt, keep it.

Leak Detection Methods

Federal UST regulations require that owners and operators of all UST systems provide a method, or combination of methods, of release detection that:

- Can detect a release from any portion of the UST and the connected piping that routinely contains stored product;

- Is installed, calibrated, operated, and maintained in accordance with the manufacturer's instructions; and

- Meets the specific performance requirements for each release detection method.

Your cooperative must check its USTs at least once a month to see if they are leaking. You have several options for performing monthly monitoring of the UST using one (or a combination) of the following **monthly monitoring leak detection methods**:

- ***Automatic tank gauging***—This method uses automated processes to monitor product level and inventory control in the tank (not applicable to piping).

- ***Vapor monitoring***—This method samples vapors in the soil gas surrounding the UST. Leaked petroleum produces vapors that can be detected in the soil gas. The regulations describe several requirements for using this leak detection method. For example, this method requires using porous soils in the backfill and locating the monitoring devices in these porous soils near the UST system.

- ***Interstitial monitoring***—This method detects leaks in the space between the UST and a second barrier or wall. The regulations describe several general performance requirements for the application of interstitial monitoring with double-walled USTs, USTs fitted with internal liners, and USTs using partial interception barriers located below the UST.

- ***Groundwater monitoring***—This method monitors the groundwater table near an UST for the presence of released free product on the water table. Monitoring wells near the UST are checked frequently to see if petroleum can be detected. The regulations allow manual and automatic methods for detecting petroleum in the monitoring wells. The regulations also describe several requirements for the use of this method. For example, this method cannot be used if the water table is more than 20 feet below the surface of the ground.

- ***Statistical inventory reconciliation***—In this method, a trained professional uses sophisticated computer software to conduct a statistical analysis of inventory, delivery, and dispensing data, which you must supply regularly.

- If **other methods** can be shown to work as effectively as the methods described above for leak detection, then these alternative methods can be approved by the regulatory authority.

Short-term Alterative Leak Detection Methods

There is an alternate leak detection method that can be used for **a maximum of 10 years after you install a new UST**. Instead of using one of the monthly monitoring methods noted above, you can combine inventory control (reconciled monthly) with tank tightness testing. Inventory control involves taking daily measurements of tank contents and recording deliveries and amount pumped. Based upon some daily and monthly calculations, you can discover if your tank may be leaking. Tank tightness testing usually requires taking the UST out of service while changes in level or volume over time are measured. Your UST will need a tank tightness test every 5 years. **After 10 years, you must use one of the monthly monitoring methods discussed above.** This alternative leak detection method can also be used for existing USTs for 10 years following the date the tank has corrosion protection installed, or until December 1998, whichever is later.

For existing USTs that lack corrosion protection (see discussion below), there is the option of using monthly inventory control combined with **annual** tank tightness testing, but this option can be used only until December 1998.

For small USTs, (tanks of 2,000 gallons capacity or less) **manual tank gauging** may be an option as a leak detection method, either by itself or in combination with tank tightness testing. The manual tank gauging method involves keeping the tank undisturbed for at least 36 hours each week, during which the tank's contents are measured, twice at the beginning and twice at the end of the test period. Manual tank gauging can be used as the sole method of leak detection for the life of the tank ***only*** for tanks up to 1,000 gallons. For tanks between 1,001 and 2,000 gallons, this method can be used only in combination with periodic tank tightness testing. This combined method, however, can be used only during the first 10 years following new tank installation. This method also can be used for existing USTs for 10 years following the date the tank has corrosion protection, or December 1998, whichever is later.

Additional Leak Detection for Piping

If you UST has **pressurized piping**, it must meet the following requirements:

- The piping must have devices that automatically shut off or restrict flow or have an alarm that indicates a leak.

- You must either conduct an **annual** tightness test of the piping or use one of the following monthly methods noted above for tanks: interstitial monitoring, vapor monitoring, groundwater monitoring, statistical inventory reconciliation, or other approved monthly methods.

If your UST has **suction piping**, your leak detection requirements will depend on which type of suction piping you have. One type of suction piping does **not** require leak detection if it has the following characteristics:

- Below-grade piping operating at less than atmospheric pressure is sloped so that the piping's contents will drain back into the storage tank if the suction is released.

- Only one check valve is included in each suction line and is located directly below the suction pump.

Suction piping that does **not** exactly match the characteristics noted above must have leak detection, either monthly monitoring (using one of the monthly methods noted above for use on pressurized piping) or tightness testing of the piping every 3 years.

Corrosion Protection

Metal USTs and piping must have corrosion protection

Corrosion is the dissolution or gradual wearing away of a material, especially by chemical action. Metal is especially susceptible to corrosion. If your UST or piping is made of metal or has metal components, you must have some form of corrosion protection for them.

DEFINITION – CORROSION

Corrosion results when bare metal, soil, and moisture conditions combine to produce an underground electric current that destroys metal. Corrosion creates holes and leaks develop.

Corrosion protection includes, but is not limited to, the following:

- Constructing the tank and piping of non-corrodible material, such as fiberglass,
- Enclosing or coating the tank and piping with non-corrodable material, and
- Cathodic protection. There are two cathodic protection methods:
  - ✔ ***Sacrificial Anode System***—Sacrificial anodes can be attached to the UST for corrosion protection. Sacrificial anodes are pieces of metal more electrically active than the steel UST. Because these anodes are more active, the corrosive current will exit from them rather than the UST. Thus, the UST is protected while the attached anode is "sacrificed."
  - ✔ ***Impressed Current System***—An impressed current system uses a rectifier to convert alternating current to direct current. This current is sent through an insulated wire to the anodes, which are special metal bars buried in the soil near the UST. The current then flows through the soil to the UST system, and returns to the rectifier through an insulated wire attached to the UST. The UST system is protected because the

current going to the UST system overcomes the corrosion-causing current normally flowing away from it.

The types of corrosion protection options available, and required for your system are discussed below. All corrosion protection systems must be operated and maintained to provide continuous corrosion protection to the metal components of the portion of the UST and piping that are in contact with the ground and routinely contain petroleum products or hazardous substances.

Corrosion Protection for Existing USTs

If your existing UST does not have corrosion protection, you must add it. For existing steel tanks lacking corrosion protection, it is not practical to add coatings or claddings. Instead, to add corrosion protection to existing steel tanks, you must either add cathodic protection (see below) to your tank, install an internal lining, or both. For each approach, there are procedures you should follow to ensure the adequacy of the corrosion protection you install.

If you are adding **only cathodic protection**, you must assess the integrity of your tank to make sure it is structurally sound. **If the UST is not sound, discontinue using the tank, and follow instructions in Sections 5.1.4 and 5.1.5 for closing the tank and corrective action.** The following are methods you can use to assess the structural integrity of your tank, depending on the age of the tank:

- If the tank is **less than 10 years old**, you can use results from one of the monthly leak detection methods to show the UST is not leaking (interstitial monitoring, automatic tank gauging, vapor monitoring, groundwater monitoring, statistical inventory reconciliation, or other approved methods).

- If the tank is **less than 10 years old**, you can use results from two tank tightness tests to show the UST is not leaking. The first test takes place before you install cathodic protection, and the second test takes place between 3 and 6 months after installation.

- If the tank is **10 years old or more**, it can be internally inspected, tested, and assessed to make sure that the tank is structurally sound and free of corrosion holes (see 5.3.2 for industry codes).

- You can assess the tank for corrosion holes by a method that the regulatory authority determines is no less protective than those above.

Cathodic protection systems must be designed and tested by qualified experts.

After determining your tank is structurally sound, you can install cathodic protection. Regulations require a qualified corrosion expert to design cathodic protection systems installed at the UST site. The system must be tested by a qualified cathodic protection tester within 6 months of installation and at least every 3 years thereafter. You will need to keep the results of the last two tests to prove that the cathodic protection is working. In addition, you must inspect an impressed current system every 60 days to verify that the system is operating. Keep results of your last three inspections to prove that the impressed current system is operating properly.

If you are **adding only an interior lining** to the tank, the interior can be lined with a thick layer of non-corrodible material (see Section 5.3.2 for industry codes). Tanks using ***only*** an interior lining for corrosion protection must pass an internal reinspection in 10 years and every 5 years after that to make sure that the lining is sound. Keep records of the inspection results.

If you **add both cathodic protection and an interior lining**, the advantages for you of this combined method are simple: your USTs receive more protection; and you are not required to have the interior lining periodically inspected (which saves you the cost of these inspections). You will still need to have the cathodic protection system periodically tested and inspected and to keep records (as explained above).

Existing steel piping must have cathodic protection. Note that cathodic protection needs to be designed by a qualified corrosion expert, tested and inspected periodically, and records kept (as explained above). Piping entirely made of (or enclosed in) non-corrodible material, such as fiberglass, does not need cathodic protection.

Corrosion Protection for New USTs

Your new USTs must match one of the following performance standards for corrosion protection:

- ***Tank and piping completely made of non-corrodible material, such as fiberglass***—Corrosion protection is also provided if tank

and piping are completely isolated from contact with the surrounding soil by being enclosed in or "jacketed" in non-corrodible material.

- ***Tank and piping made of steel having a corrosion-resistant coating AND having cathodic protection (such as an sti-P$_3$® tank with appropriate piping)***—A corrosion-resistant coating electrically isolates the coated metal from the surrounding environment to help protect against corrosion. ***Asphaltic coating does NOT qualify as a corrosion-resistant coating.*** Methods of cathodic protection are briefly explained above.

- ***Tank made of steel clad with a thick layer of non-corrodible material (such as an ACT-100® tank)***—This option does not apply to piping. ***Galvanized steel is NOT a non-corrodible material.***

New tank cathodic protection inspection require-ments

New UST systems equipped with cathodic protection must be inspected for proper operation by a qualified cathodic protection inspector. The inspection must be conducted within 6 months of installation and at least every 3 years thereafter. The inspection criteria should be in accordance with the standards established by a nationally recognized association, such as the National Association of Corrosion Engineers. Records of the inspection should be maintained for at least the last two sets of inspection results. A qualified corrosion expert must design cathodic protection systems, such as impressed current systems, that are installed at the UST site. Impressed current systems must be inspected every 60 days to ensure proper equipment operation.

Spill and Overfill Protection

How spills and overfills can occur

Many releases at UST sites come from spills and/or from overfilling the tank. Human error causes most spills and overfills. Spills often occur at the fill pipe when the delivery truck's hose is disconnected. Although these spills are usually small, repeated small releases can cause big environmental problems. Overfills usually occur when a tank is overfilled and the excess is released at the fill pipe, through loose fittings on the top of the tank, and/or through a loose vent pipe. The tightness of these fittings normally would not be a problem if the tank were not filled beyond its capacity. Overfills usually release much larger volumes than spills.

To prevent spills and overfills, the regulations specify spill and overfill protection requirements for all tanks. These requirements include the following:

- **All USTs must have catchment basins** to contain spills. These are described below. New USTs must have catchment basins when they are installed; existing USTs must have catchment basins installed by December 22, 1998.

- **All USTs must have overfill protection.** The three main types of overfill protection devices (automatic shutoff devices, overfill alarms, and ball float valves) are described below. New USTs must have overfill protection devices when they are installed.

- You and your fuel deliverer must **follow industry standards for correct filling practices.** For example, you must make sure there is room in the UST for the delivery, and the delivery driver must watch the delivery at all times. If you and the delivery driver follow standard practices, nearly all spills and overfills can be prevented.

Exemption for overfill protection

All UST systems must be equipped with overfill protection, unless the UST never receives more than 25 gallons at a time. Many small used oil tanks fall in this category. However, if your UST receives more than 25 gallons at a time, you must comply with the overfill requirements in the regulations.

What are Catchment Basins?

Catchment basins are also called “spill containment manholes” or “spill buckets.” Basically, a catchment basin is a bucket sealed around the fill pipe). To protect against spills, the basin should be large enough to contain what may spill when the delivery hose is uncoupled from the fill pipe. Basins range in size from those capable of holding only a few gallons to those that are much larger--the larger the catchment basin, the more spill protection it provides. You need a way to remove liquid from catchment basins. Manufacturers equip catchment basins with either pumps or drains to remove liquid.

You should try to keep water out of catchment basins. Some catchment basins can collect enough water and sediment, along with spilled product, to make draining this mixture into the tank unwise. If this happens, you may pump out the catchment basin and dispose of the liquid properly. If the liquid contains fuel or chemicals, it could be considered a hazardous waste (see Chapter 3). Contact your state agency responsible for hazardous waste for information on testing and handling requirements and review the information in Chapter 3 on managing hazardous wastes.

What are Overfill Protection Devices?

Overfill protection devices include automatic shutoff devices, overfill alarms, and ball float valves. If you have "pumped delivery" where fuel is delivered under pressure, you must make sure your overfill protection device works compatibly with pumped deliveries. Also, remember that overfill protection devices are effective only when combined with careful filling practices.

Automatic shutoff devices are installed in an UST's fill pipe. These devices can slow down and then stop the delivery when the product has reached a certain level in the tank. This device—sometimes simply called a "fill pipe device"—has one or two valves that are operated by a float mechanism. Some automatic shutoff devices work in two stages. The first stage drastically reduces the flow of product to alert the driver that the tank is nearly full. The driver can then close the delivery valve and still have room in the tank for the product left in the delivery hose. If the driver does not pay attention and the liquid level rises higher, the valve closes completely and no more liquid can be delivered into the tank, leaving the driver with a delivery hose full of product.

Overfill alarms use probes installed in the tank to activate an alarm when the tank is either 90 percent full or within 1 minute of being overfilled. Either way, the alarm should provide enough time for the driver to close the truck's shutoff valve before an overfill happens. Alarms must be located where the driver can see or hear them easily. (Overfill alarms are often a part of automatic tank gauging systems.) Overfill alarms work only if they alert the driver at the right time and the driver responds quickly. Remember to put the alarm on an electrical circuit that is active all the time so that the alarm will always work. Many deliveries are made at night when the facility is closed. You don't want to turn off your alarm when you turn off the office lights.

Ball float valves are placed at the bottom of the vent line several inches below the top of the UST. The ball floats on the product and rises with product level during delivery until it restricts vapor flowing out the vent line BEFORE the tank is full. If all tank fittings are tight, the ball float valve can create enough back pressure to restrict product flow into the tank—which can notify the driver

USEFUL TIP

Manufacturers do not recommend using ball float valves with suction piping, pressurized delivery, or coaxial Stage I vapor recovery.

to close the truck's shutoff valve. However, if the UST has loose fittings, sufficient back pressure may not develop and will result in an overfill.

Requirements for Existing USTs

All existing UST systems must meet the requirements for all tanks discussed above, as well as the minimum performance standards provided in Table 5-2. Note the compliance deadlines in 1993 for leak detection and 1998 for spill, overfill, and corrosion protection indicated in the table. If you have not already done so, do an inventory of your USTs to determine whether they comply with these minimum performance standards, and whether any or all have been upgraded or replaced to bring them into compliance. If your USTs are not in compliance with the minimum performance standards for existing USTs by the required deadlines, you can be cited for violations and fined.

Note that your existing **USTs must be in compliance now** with leak detection requirements and must be in compliance with spill, overfill, and corrosion protection requirements by December 22, 1998. Additional options available to you are to close the existing UST or replace the existing UST with a new UST that meets the performance standards for new USTs.

Requirements for New USTs

All new USTs must be properly designed and constructed according to a code of practice developed by a nationally recognized association or independent testing laboratory (See Section 5.3). For new UST systems, performance standards for leak detection, corrosion protection, and spill/overfill prevention should be incorporated into the design and construction of the system. At the time of installation, new UST systems must comply with requirements for leak detection and spill, overfill, and corrosion protection listed in Table 5-3. If your new USTs are not in compliance with the minimum performance standards when installed, you can be cited for violations and fined.

Table 5-2. Performance Standards for Existing UST Systems

LEAK DETECTION: Last Compliance Deadline Was December 1993

EXISTING TANKS	Monthly Monitoring*; or Monthly Inventory Control and Annual Tank Tightness Testing *(This choice can only be used until December 1998.)*; or Monthly Inventory Control and Tank Tightness Testing Every 5 Years *(This choice can only be used for 10 years after tank has been protected from corrosion, or until December 1998, whichever is later).*	
EXISTING PRESSURIZED PIPING *Choice of one from each set*	Automatic Flow Restrictor; or Automatic Shutoff Device; or Continuous Alarm System	Annual Line Testing; or Monthly Monitoring* *(except automatic tank gauging)*
EXISTING SUCTION PIPING	Monthly Monitoring* *(except automatic tank gauging); or* Line Testing Every 3 Years; or No Requirements**	
CORROSION PROTECTION: Compliance Deadline Is December 22, 1998		
EXISTING TANKS	Same Options as for New Tanks; or Add Cathodic Protection System; or Interior Lining; or Interior Lining and Cathodic Protection	
EXISTING PIPING	Same Options as for New Piping; or Cathodically Protected Steel	
SPILL/OVERFILL PROTECTION: Compliance Deadline Is December 22, 1998		
EXISTING TANKS	Catchment Basins; and Automatic Shutoff Devices or Overfill Alarms or Ball Float Valves	

* Monthly Monitoring includes: Automatic Tank Gauging, Ground Water Monitoring, Vapor Monitoring, Statistical Inventory Reconciliation, Interstitial Monitoring, and other approved methods.
**Types of suction piping that do not require leak detection include: below-grade piping that is sloped so that the piping's contents will drain back into the storage tank if the suction is released and suction lines that have only one check valve that is located directly below the suction pump.

Table 5-3. Performance Standards for New UST Systems

LEAK DETECTION		
NEW TANKS	Monthly Monitoring*, *or* Monthly Inventory Control and Tank Tightness Testing Every 5 Years *(acceptable only for 10 years after installation)*	
NEW PRESSURIZED PIPING *Choice of one from each set*	Automatic Flow Restrictor, *or* Automatic Shutoff Device, *or* Continuous Alarm System	Annual Line Testing, *or* Monthly Monitoring* *(except automatic tank gauging)*
NEW SUCTION PIPING	Monthly Monitoring* *(except automatic tank gauging)*, *or* Line Testing Every 3 Years, *or* No Requirements**	
CORROSION PROTECTION		
NEW TANKS	Coated and Cathodically Protected Steel; or Fiberglass; or Steel Tank clad with Fiberglass	
NEW PIPING	Coated and Cathodically Protected Steel; or Fiberglass	
SPILL/OVERFILL PROTECTION		
NEW TANKS	Catchment Basins; and Automatic Shutoff Devices or Overfill Alarms or Ball Float Valves	

* Monthly Monitoring includes: Automatic Tank Gauging, Ground Water Monitoring, Vapor Monitoring, Statistical Inventory Reconciliation, Interstitial Monitoring, and other approved methods.
**Types of suction piping that so not require leak detection include: below-grade piping that is sloped so that the piping's contents will drain back into the storage tank if the suction is released and suction lines that have only one check valve that is located directly below the suction pump.

Owners and operators must certify that proper installation standards were followed and must identify the methods and procedures used to install the system. See Section 5.3 for organizations to contact for proper installation standards.

Proper installation is crucial to ensure the structural integrity of any new tank system. Installation of an UST system should be conducted in accordance with standards established by several professional and scientific organizations, such as the National Fire Prevention Association, the American Petroleum Institute, and the Steel Tank Institute. UST system owners must be able to certify that the tank system was installed according to the standards of one of these organizations. See Section 5.3 for contacting these organizations.

5.1.4 Closure Requirements for New and Existing UST Systems

You can close your UST **temporarily** or **permanently.**

Closing Temporarily

You may temporarily close your UST for up to 12 months by following these requirements for **temporary closure**:

- Continue to monitor for leaks by maintaining the UST's leak detection. (If your UST is *empty*, you do not need to maintain leak detection.) Also, continue to monitor and maintain any corrosion protection systems. If a release is discovered, quickly stop the release, notify your regulatory authority, and take appropriate action to clean up the site.

- If the UST remains temporarily closed for more than 3 months, leave vent lines open, but cap and secure all other lines, pumps, manways, and ancillary equipment.

After 12 months of **temporary** closure, you have three options:

- **Permanently close your UST** if it doesn't meet the applicable requirements for new or upgraded USTs (except for spill and overfill).

WARNING
People are killed or injured every year while closing or removing tanks. Use safe removal practices (see 5.3.2 for a safe closure standard). Only trained professionals should close or remove USTs.

- **Ask your regulatory authority for an extension** beyond 12 months, if you provide an assessment that determines whether contamination is present at your site.

- **Keep the UST temporarily closed** without needing an extension granted by the regulatory authority if the UST meets the applicable requirements for new or upgraded USTs (except for spill and overfill) and the requirements noted above for temporary closure.

Closing Permanently

If you decide to close your UST permanently, follow these requirements for **permanent closure**:

- Notify the regulatory authority at least 30 days before you close your UST.

- Determine if contamination from your UST is present in the surrounding environment. If there is contamination, you may have to take corrective action. For at least 3 years, keep a record of the actions you take to determine if contamination is present at the site (or you can mail this record to your regulatory authority).

- Either remove the UST from the ground or leave it in the ground. In both cases, the tank must be emptied and cleaned by removing all liquids, dangerous vapor levels, and accumulated sludge. These potentially very hazardous actions need to be carried out carefully by trained professionals who follow standard safety practices. If you leave the UST in the ground, have it filled with a harmless, chemically inactive solid, like sand.

5.1.5 Corrective Action/Site Remediation

Pay attention to warning signs that your tank is leaking.

There are warning signals that indicate your UST may be leaking and creating problems for the environment and your business. By paying careful attention to the early warning signals and reacting to them quickly before major problems develop, you can minimize potential environmental and liability problems.

You should suspect a leak when you discover the following warning signals:

- **Unusual operating conditions** (such as erratic behavior of the dispensing pump). Check first to see if this problem results from equipment failure that can be repaired.

- **Results from leak detection monitoring and testing that indicate a leak.** What at first appears to be a leak may be the result of faulty equipment that is part of your UST system or its leak detection. Double check this equipment carefully for failures.

If you suspect leaks based on the occurrence of these early warning signals, you need to **call your regulatory authority**. Then, you must find

out quickly if these ***suspected leaks*** are ***actual leaks*** using the following investigative steps:

- Conduct tightness testing of the entire UST system.
- Check the site for additional information on the presence and source of contamination.

If these system tests and site checks confirm a leaking UST, follow the actions for responding to **confirmed** leaks described below.

Respond to evidence of leaked petroleum at or near your cooperative.

If you store petroleum products in USTs, you must also respond quickly to any evidence of leaked petroleum that appears at or near your cooperative. For example, neighbors might tell you they smell petroleum vapors in their basements or taste petroleum in their drinking water. If evidence of this type is discovered, **you must report this discovery immediately** to the regulatory authority and take the investigative steps and follow-up actions noted above.

Responding to Confirmed Leaks

Your response to **confirmed** releases comes in two stages: **short-term** and **long-term actions**.

Short-term Actions

- Take immediate action to stop and contain the release.
- Report the release to the regulatory authority within 24 hours. However, petroleum spills and overfills of less than 25 gallons do not have to be reported if you immediately contain and clean up these releases.
- Make sure the release poses no immediate hazard to human health and safety by removing explosive vapors and fire hazards. Your fire department should be able to help or advise you with this task. You must also make sure you handle contaminated soil properly so that it poses no hazard (for example, from vapors or direct contact).
- Remove petroleum from the UST system to prevent further release into the environment.

- Find out how far the petroleum has moved and begin to recover the leaked petroleum (such as product floating on the water table). Report your progress and any information you have collected to the regulatory authority no later than 20 days after confirming a release.

- Investigate to determine if the release has damaged or might damage the environment. This investigation must determine the extent of contamination both in soils and groundwater. You must report to the regulatory authority what you have learned from an investigation of your site according to the schedule established by the regulatory authority. At the same time, you must also submit a report explaining how you plan to clean up the site. Additional site studies may be required.

Long-term Actions

Based on the information you have provided, the regulatory authority will decide if you must take further action at your site. You may need to take two more actions:

- Develop and submit a Corrective Action Plan that shows how you will meet requirements established for your site by the regulatory authority.

- Make sure you implement the steps approved by the regulatory authority for your site.

Can Leaking Tanks Be Repaired?

You can repair a leaking tank if the person who does the repair carefully follows standard industry codes that establish the correct way to conduct repairs. (See 5.3.2 for industry codes and standards.)

Within 30 days of the repair, you must prove that the tank repair has worked by doing one of the following:

- Have the tank inspected internally or tightness tested following standard industry codes; or

- Use one of the monthly leak detection monitoring methods; or

- Use other methods approved by the regulatory authority.

Within 6 months of repair, USTs with cathodic protection must be tested to show that the cathodic protection is working properly. You must keep records for each repair as long as you keep the UST in service.

Can Leaking Piping Be Repaired?

Damaged **metal** piping **cannot** be repaired and must be replaced. Loose fittings can be tightened, and in some cases that may solve the problem. Piping made of fiberglass-reinforced plastic can be repaired, but **only** in accordance with the manufacturer's instructions or national codes of practice. Within 30 days of the repair, piping must be tested in the same ways noted above for testing tank repairs (except for internal inspection).

5.1.6 State Regulations

RCRA, Subtitle I establishes requirements that states must meet to have a Federally approved UST program. Presently, 24 states have EPA-approved UST programs. In many cases, the state regulations in their final form are extensions of the Federal UST program and the requirements of each state must be at least as stringent as the corresponding Federal regulations. Under the Subtitle I requirements, states with approved UST programs have primary enforcement responsibility with respect to UST program requirements in their states. It is important to be aware of state and local requirements for UST systems. All state and territory UST program offices can be found on EPA's Web site at **http://www.epa.gov/swerust1/states/statcon1.htm**.

5.2 ABOVEGROUND STORAGE TANKS

By definition, an aboveground storage tank (AST) system must have more than 90 percent of the tank and its associated piping aboveground. The Clean Water Act (CWA) contains the requirements for ASTs, and many requirements for UST systems are applicable to AST systems (i.e., spill/overfill protection, leak detection). In addition, there are other requirements for AST systems mandated by the Spill Prevention Control and Countermeasure (SPCC) rule, as well as by fire codes that should be incorporated into the system.

Integrity testing for your AST

As outlined by CWA, AST systems should be subject to periodic integrity testing. The testing method used should take into account tank design features such as a floating roof, and should use such techniques as hydrostatic testing, visual inspection or a system of non-destructive shell thickness testing. Tank supports and foundations should be included in

these inspections. In addition, periodic pressure testing may be warranted for piping in areas where facility drainage is such that equipment failure may lead to a spill event. Testing records should be kept where appropriate, and used for comparison.

Visually inspect the outside of your AST frequently.

In addition to integrity testing, the outside of the tank should frequently be observed by operating personnel for signs of deterioration, leaks which might cause a spill, or accumulation of oil inside diked areas. All aboveground valves and pipelines should be subjected to regular inspections by operating personnel. These inspections should be conducted to note the general condition of the tank equipment, such as flange joints, expansion joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces.

Containment for spills from ASTs

ASTs and their piping should be equipped with appropriate containment and/or diversionary structures or equipment to prevent discharged oil from reaching a navigable water course. This is usually accomplished by constructing special containment areas and drainage lines (equipped with oil/water separators) not only at the tank location, but in the vicinity of the tank itself. One of the following preventive systems or its equivalent should be used as a minimum:

- For onshore facilities:
  - ✔ Dikes, berms or retaining walls sufficiently impervious to contain spilled oil
  - ✔ Curbing
  - ✔ Culverting, gutters or other drainage systems
  - ✔ Weirs, booms or other barriers
  - ✔ Spill diversion ponds
  - ✔ Retention ponds
  - ✔ Absorbent materials

- For offshore facilities:
  - ✔ Curbing or drip pans
  - ✔ Sumps and collection systems.

AST systems that are **exempt** from CWA regulations include:

- Onshore and offshore facilities which, due to their location, could not be reasonably expected to discharge oil into or upon the navigable waters of the U.S. or adjoining shorelines

- Equipment or operations of vessels or transportation related to onshore and offshore facilities which are subject to the authority of the U.S. Department of Transportation (DOT)

- Both of the following criteria are met:

  ✔ The underground buried storage capacity of the facility is 42,000 gallons or less of oil

  ✔ The storage capacity which is not buried at the facility is 1,320 gallons of oil or less and no single container exceeds a capacity of 660 gallons.

5.3 RESOURCES

5.3.1 References

For information on USTs, you can go to EPA's Office of Underground Storage Tanks Web site at **http://www.epa.gov/OUST/** to download, order, or read documents online. You can call EPA's **toll-free** RCRA/ Superfund Hotline at 800 424-9346 and order ***up to 30 free copies***. Or you can write and ask for titles by addressing your request to NCEPI, our publication distributor: NCEPI, Box 42419, Cincinnati, OH 45242. Or you can make your request by calling NCEPI's toll-free number at 800 490-9198. Or you can fax your order to NCEPI at 513 891-6685. If you want ***more than 30 copies***, contact Jay Evans at 703 603-7149.

Publications About USTs

Musts For USTs: A Summary Of Federal Regulations For USTs. Booklet clearly summarizes federal UST requirements for installation, release detection, spill, overfill, and corrosion protection, corrective action, closure, reporting and recordkeeping. Updated & revised 1995. **Normas y Procedimientos para T.S.A.** Spanish translation of 1988 edition of **Musts For USTs**.

Straight Talk On Tanks: Leak Detection Methods For Petroleum USTs. Booklet explains federal requirements for leak detection and describes allowable leak detection methods. Updated & revised 1995.

Doing Inventory Control Right: For USTs. Booklet describes how owners/operators of USTs can use inventory control and periodic tightness testing to meet federal leak detection requirements. Contains reporting forms.

Manual Tank Gauging: For Small USTs. Booklet provides simple, step-by-step directions for conducting manual tank gauging for tanks 2,000 gallons or smaller. Contains reporting forms .

Introduction To Statistical Inventory Reconciliation: For USTs. Booklet describes the use of Statistical Inventory Reconciliation (SIR) to meet federal leak detection requirements .

Don't Wait Until 1998: Spill, Overfill, And Corrosion Protection For USTs. Information to help owners and operators of USTs meet the 1998 deadline for compliance with requirements to upgrade, replace, or close USTs installed before December 1988. Materials available as a 16-page booklet, a tri-fold leaflet, or Spanish translation of the booklet (*No Espere Hasta El 1998!*).

Dollars And Sense: Financial Responsibility Requirements For USTs. Booklet clearly summarizes the "financial responsibility" required of UST owners/operators by federal UST regulations.

An Overview Of UST Remediation Options. Information about technologies that can be used to remediate petroleum contamination in soil and groundwater.

Controlling UST Cleanup Costs. Fact sheet series on the cleanup process includes: *Hiring a Contractor, Negotiating the Contract, Interpreting the Bill, Managing the Process, and Understanding Contractor Code Words*.

Pay-For-Performance Cleanups: Effectively Managing UST Cleanups. Booklet explores potential advantages of using pay-for-performance cleanup agreements to reduce the cost and time of cleanups and more effectively manage cleanup resources.

5.3.2 For Further Information

Industry Codes and Standards

Installation

API Recommended Practice 1615 (1987), *Installation of Underground Petroleum Storage Systems*

PEI RP100-94 (1994), *Recommended Practices for Installation of Underground Liquid Storage Systems*

Tank Filling Practices

NFPA 385 (1985), *Standard for Tank Vehicles for Flammable and Combustible Liquids*

Closure

API Recommended Practice 1604 (1996), *Closure of Underground Petroleum Storage Tanks*

Assessing Tank Integrity, Repairing Tanks, and Interior Lining of Tank

API Recommended Practice 1631 (1992), *Interior Lining of Underground Storage Tanks*

NLPA Standard 631 (1991), *Entry, Cleaning, Interior Inspection, Repair, and Lining of Underground Storage Tanks*

Corrosion Protection

API Recommended Practice 1632 (1987), *Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems*

NACE RP-0169-92 (1992), *Standard Recommended Practice: Control of Corrosion on Underground or Submerged Metallic Piping Systems*

NACE RP-0285-85 (1985), *Standard Recommended Practice: Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems*

STI R892-91 (1991), *Recommended Practice for Corrosion Protection of Underground Piping Networks Associated with Liquid Storage and Dispensing Systems*

General (Repair, Spill and Overfill, Installation, Compatibility)

API Recommended Practice 1621 (1993), *Bulk Liquid Stock Control at Retail Outlets*

API Recommended Practice 1626 (1985), *Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Service Stations*

API Recommended Practice 1627 (1986), *Storage and Handling of Gasoline-Methanol/Cosolvent Blends at Distribution Terminals and Service Stations*

API Recommended Practice 1635 (1987), *Management of Underground Petroleum Storage Systems at Marketing and Distribution Facilities*

NFPA 30 (1993), *Flammable and Combustible Liquids Code*

NFPA 30A (1993), *Automotive and Marine Service Station Code*

Organizations

API – American Petroleum Institute
1220 L Street, NW
Washington, DC 20005
(202) 682-8000

Fiberglass Petroleum Tank and Pipe Institute
9801 Westheimer, Suite 606
Houston, TX 77042-3951
(713) 465-3310

NACE International (formerly the National Association of Corrosion Engineers)
Box 218340
Houston, TX 77218-8340
(713) 492-0535

NFPA – National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101
(617) 770-3000

NLPA – National Leak Prevention Association
P.O. Box 1643
Boise, ID 83701
(208) 336-6941

PEI – Petroleum Equipment Institute
P.O. Box 2380
Tulsa, OK 74101-2380
(918) 494-9696

Steel Tank Institute

570 Oakwood Road
Lake Zurich, IL 60047
(708) 438-TANK [8265]